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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/825,033	04/14/2004	Yoshikazu Fujimori	12844.15USD1	7384
23552	7590	11/25/2005	EXAMINER	
MERCHANT & GOULD PC P.O. BOX 2903 MINNEAPOLIS, MN 55402-0903			NGUYEN, HA T	
			ART UNIT	PAPER NUMBER
			2812	

DATE MAILED: 11/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/825,033

Applicant(s)

FUJIMORI, YOSHIKAZU

Examiner

Ha T. Nguyen

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 October 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,6 and 9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,6 and 9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Notice to applicant

1. Applicant's Amendment and Response to the Office Action mailed 7-13-5 has been entered and made of record .

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horie et al. (USPN 6517642, hereinafter "Horie").

[Re claim 1] Horie discloses a method of forming a ferroelectric thin film, comprising: forming a seed layer containing an ultra-fine particle powder comprised of an element constituting the thin film to be subsequently formed on a surface of a substrate; and forming the thin film on the seed layer (see col. 7, lines 28-41), the use of a mixture of a plurality of metal powders and the formation of metal oxides (see col. 4, lines 27-52, and col. 10, lines 12-19). The examiner interpreted the first layer in the multiple cycle deposition to be the seed layer; [Re claim 2] wherein forming the seed layer includes: applying a solution containing the element constituting the thin film to the surface of the substrate; and drying and baking the solution applied to the substrate (see col. 5, lines 33-60); [Re claim 3] wherein forming the thin film includes annealing the seed layer for crystallization (see col. 6, lines 6-16).

But it fails to disclose expressly that the thin film is of ferroelectric material in the same process and the concentration of the ultra-fine particle powder is in the range of 0.00001wt% to about 1wt % . However, the missing limitation is well known in the art because Horie also discloses that the method is used for forming ferroelectric material (See col. 1, lines 12-25).

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Besides Horie does not disclose any concentration of powder. However any variation in concentration in the present claims is obvious in light of the cited art, because the changes in concentration produce no unexpected function.

The routine varying of parameters to produce expected changes are within the ability of one of ordinary skill in the art. Patentability over the prior art will only occur if the parameter variation produces an unexpected result. In re Aller, Lacey and Hall, 105 U.S.P.Q. 233, 235. In re Reese 129 U.S.P.Q. 402, 406.

Therefore, it would have been obvious to use Horie's teaching to obtain the invention as specified in claims 1-3 .

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamura et al. (EP 940856 , hereinafter "Nakamura") in view of Horie.

Referring to Fig. 1 and related text, Nakamura discloses a method of forming a ferroelectric memory including an FET of an MFMIS structure, said method comprising: forming a gate insulating film 24 on a semiconductor substrate 22 and between source-drain regions S, D; forming a floating gate 26 on the gate insulating film; forming a ferroelectric layer 28 on the floating gate; and forming a control gate 30 on the ferroelectric layer.

But it fails to disclose expressly, wherein forming the ferroelectric layer comprises: forming a seed layer on a surface of the floating gate, the seed layer containing an ultra-fine particle powder comprised of an element constituting a ferroelectric thin film to be subsequently formed on the seed layer; forming the ferroelectric thin film on the seed layer, and the concentration of the ultra-fine particle powder is in the range of 0.00001wt% to about 1wt %.

However, the missing limitations are well known in the art because Horie discloses these features, as shown above.

A person of ordinary skill is motivated to modify Nakamura with Horie to obtain ferroelectric material of uniform composition.

Therefore, it would have been obvious to combine Nakamura with Horie to obtain the invention as specified in claim 6.

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5. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kim (USPN 6020233) in view of Horie.

Kim discloses a method of forming a ferroelectric memory comprising: forming an FET including a gate electrode 203 formed on a surface of a semiconductor substrate 201 between source-drain regions, the source-drain regions formed on the surface of the semiconductor substrate through a gate insulating film; and forming a ferroelectric capacitor 210-260 connected with one of the source-drain regions of the FET through a storage node contact 206, wherein forming the ferroelectric capacitor comprises: forming a first electrode 230 and forming the ferroelectric thin film 250 on the first electrode.

But it fails to disclose expressly forming a seed layer on a surface of the first electrode the seed layer containing an ultra-fine particle powder comprised of an element constituting a ferroelectric thin film to be subsequently formed on the seed layer; forming the ferroelectric thin film on the seed layer, and the concentration of the ultra-fine particle powder is in the range of 0.00001wt% to about 1wt %.

However, the missing limitations are well known in the art because Horie discloses these features, as shown above.

A person of ordinary skill is motivated to modify Kim with Horie to obtain ferroelectric material of uniform composition.

Therefore, it would have been obvious to combine Kim with Horie to obtain the invention as specified in claim 9.

Response to Amendment

6. Applicant's arguments with regard to the rejections under 35 U.S.C. 103 have been fully considered, but they are not deemed to be persuasive for at least the following reasons.

Applicant argued that the applied references do not teach the concentration of the ultra-fine particle powder to be in the range of 0.00001wt% to about 1wt %. This is true, however, the instant specification does not disclose that the concentration of the fine powder plays a critical role in the process of the claimed invention. An ordinary artisan is motivated to use a small amount of seed material to initiate film growth, depending on the grain sizes and the duration of film growth, an appropriate amount of seed material is used.

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Therefore the applied references do make obvious all the limitations of the rejected claims 1-3, 6, and 9.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for response to this final action is set to expire THREE MONTHS from the date of this action. In the event a first response is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for response expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ha T. Nguyen whose telephone number is (571) 272-1678. The examiner can normally be reached on Monday-Friday from 8:30AM to 6:00PM, except the first Friday of each bi-week. The telephone number for Wednesday is (703) 560-0528.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael S. Lebentritt, can be reached on (571) 272-1873. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Ha Nguyen
Primary Examiner
11-21-05